

REPORT ON ACTIVITIES OF THE BUREAU OF MINES WITH REGARD TO
PETROLEUM, NATURAL GAS, AND RELATED HYDROCARBONS

Introduction

The authority of the Bureau of Mines is based on the statute of May 16, 1910, amended on February 25, 1913, which creates the Bureau in the Department of the Interior and outlines its functions and responsibilities.

The purpose of the Bureau is to improve health conditions, to promote safety in the mineral industry, to aid the economic development and conservation of mineral resources, and conduct investigations on the mining, preparation, and utilization of minerals.

The Bureau of Mines consists of a National Headquarters in Washington, D. C., and various activities outside of Washington. The National Headquarters, known as the Office of the Director, is composed of the Director, as Chief Executive; Office of Minerals Reports, which directs information activities, and six branches, dealing respectively with administration, health and safety, fuels and explosives, mining, metallurgy, and economics and statistics.

The Administrative Branch is responsible for the management of the administrative and fiscal work of the Bureau, including property, budget and fiscal management, personnel management, safe and healthful working conditions for employees and the conduct of related administrative services.

The investigative and research work of the Bureau is conducted in the field (outside of Washington, D. C.) at special offices and installations. Each of the field activities is in charge of a specialist who reports directly to his branch chief in Washington, D. C.

Within the Bureau, the functions bearing on oil, natural gas, and related hydrocarbons are performed by the Fuels and Explosives Branch, the Economics and Statistics Branch, the Health and Safety Branch, and the Office of Minerals Reports.

PART I

The Fuels and Explosives Branch

The Branch conducts scientific research and technologic investigations pertaining to coal, petroleum, natural gas and their products and explosives, with particular reference to the conservation and most efficient utilization of mineral fuel resources. It also supplies factual information and data on the above subjects for use by the Bureau, the Department, and other Government agencies and for publication for use by the Government, industry, and the public. The Branch is composed of the Petroleum and Natural Gas Division, Fuels Utilization Division, Office of Synthetic Liquid Fuels, Coal Division, and Explosives Division.

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The activities relating to petroleum, natural gas, and related hydrocarbons are centered within three units of the Fuels and Explosives Branch: Petroleum and Natural Gas Division, Fuels Utilization Division, and Office of Synthetic Liquid Fuels.

I

Petroleum and Natural Gas Division

Functions. The principal functions are:

To conduct engineering, chemical, and thermodynamic research on the production, transportation, and refining of petroleum, natural gas and their derivatives, with the view of reducing waste, increasing efficiency, and developing better methods and products.

To conduct, operate, and maintain plants that supply helium; to search for, acquire rights in, develop, and conserve helium-bearing natural gas fields; to conduct research on the conservation, production, purification and use of helium.

To supply information concerning petroleum, natural gas, and helium to Governmental agencies, industries, and the public.

Organization. The Petroleum and Natural Gas Division is composed of (1) The Petroleum Sub-Division with headquarters in Washington, which directs investigative and research activities of two experiment stations and three field offices; (2) Helium Sub-Division with Washington headquarters which supervise five plants and one laboratory in the field.

Petroleum Sub-Division

Specific Activities. The specific activities of the Petroleum Sub-Division embrace the following:

(1) Research in primary extraction of crude oil and natural gas which consists of four groups of studies: Studies of Petroleum reservoir, of pressures, temperatures, and volumetric relations in wells and reservoirs, studies of composition of reservoir fluids and the study of corrosion of equipment and high pressure wells.

(2) Research in secondary recovery and development of oil-impregnated surface and near-surface deposits. The following indicates the broad field of research: Study of past history of secondary-recovery operations; study of oil fields of the nation to disclose fields in which secondary-recovery methods may be applicable; field experimentation combined with laboratory research to test the applicability of stimulating operations in a particular field; laboratory and field tests to establish commercial methods for extracting oil from saturated surface and near-surface deposits; increase production rates and prevent abandonment of stripper wells.

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(3) The study of transportation and storage of petroleum and natural gas with a view of increasing efficiency in transportation and storage.

(4) Research in chemistry and refining of petroleum. These activities consist of crude oil surveys, pilot plant operations, hydrocarbon analysis, research on fuel combustion and on sulphur compounds.

(5) Research in thermodynamics of hydrocarbons. Three types of direct thermochemical measurements are made in the thermodynamic laboratory: the determination of heat of combustion of pure substances, the determination of the specific heat of hydrocarbon vapors at elevated temperatures, and the determination of the thermal properties of hydrocarbons from extremely low temperatures up to room temperatures or higher.

Field Offices. The investigative and research work of the Petroleum Sub-Division is carried out by the Petroleum Experiment Station in Bartlesville, Oklahoma, the Petroleum and Oil-Shale Experiment Station in Laramie, Wyoming, and Petroleum Field Offices in San Francisco, California, Dallas, Texas, and Franklin, Pennsylvania.

Personnel and Appropriations. The Washington headquarters of the Petroleum and Natural Gas Division requires the services of 13 people who perform functions of the Petroleum and Helium Sub-Divisions. The estimated expenditure of the Petroleum Sub-Division is \$65,000 for the fiscal year 1949. The two experiment stations and the three field offices of the Petroleum Sub-Division require the services of 122 people, exclusive of 50 persons employed by the Petroleum Experiment Station in Bartlesville, Oklahoma, who are paid by the State of Oklahoma on the basis of a cooperative arrangement. The estimated expenditure of the station and field offices for the fiscal year 1949 amounts to \$775,000.

Helium Sub-Division

Specific Activities. The specific activities of the Helium Sub-Division are two fold: Research in and production of helium. As to research, the Sub-Division conducts inquiries and investigations concerning resources, production, repurification, storage, and utilization of helium. These inquiries and investigations (with the exception of research on utilization aiming at the expansion of present uses of helium) are related to natural gas with special emphasis upon the helium constituent, and they are correlated to the work previously described under the heading of Petroleum Sub-Division.

As to production of helium, the Sub-Division maintains four plants capable of processing natural gas for the removal of helium. Three of the plants are in a stand-by condition, one is in operating condition for the production of helium for both Governmental and commercial users. There are no direct appropriations for the production of helium. Production is carried out on a reimbursement basis.

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Field Offices. The research functions of the Helium Sub-Division are performed by the Cryogenic Laboratory at Amarillo, Texas, while the activities pertaining to the actual production of helium are carried out by:

(a) The Administrative Office at Amarillo, Texas. The Chief Helium Engineer heading the Office under the general direction of the Chief of the Petroleum and Natural Gas Division. The Chief Engineer is in charge of all activities at all helium plants and related natural gas properties. The facilities and rights under his supervision include four helium plants which cost more than \$10,000,000; natural gas rights in 65,000 acres of land, 13 deep gas wells, and more than 275 miles of pipe line; and natural gas contracts covering about 100,000 acres of land.

(b) Amarillo Helium Plant, at Amarillo, Texas. This plant is in a stand-by condition.

(c) Exell Helium Plant, at Exell, Texas. The plant is in an operating condition.

(d) Otis Helium Plant, at Otis, Kansas. The plant is in a stand-by condition.

(e) Navajo Helium Plant, near Shiprock, New Mexico. This plant is also in a stand-by condition.

Personnel and Expenditures. As mentioned above, the Washington headquarters of the Petroleum and Natural Gas Division requires the services of 13 people who perform functions for both the Helium and Petroleum Sub-Divisions. The estimated expenditure for the helium program for the fiscal year 1947 is \$65,000. The number of people employed in the field by the Helium Sub-Division - administrative office, four plants and one laboratory - is 59 full time employees and 101 employees who are paid hourly rates established by the Wage Board. The expenditure for the fiscal year 1947 for the helium program in the field is \$650,000.

Cooperative Agreements

The Petroleum and Gas Natural Division is a party to the following cooperative arrangements:

Army Working Fund. Pursuant to a request from the Army Air Forces the Bureau of Mines formulated a program to determine the availability of crude oil and refining facilities for producing the desired fuels for military aircraft. The program has been divided into the following categories of studies: Crude oils; refinery processes; refinery products; refinery capacity; and availability.

The program submitted by the Bureau was accepted and the War Department transferred \$105,175 as a working fund during the latter part of the fiscal year 1946, to bear the expenses of the program during the remainder of that year and the fiscal year 1947. The research program is carried out at the Petroleum Experiment Station in Bartlesville, Oklahoma.

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Twenty-three classified employees are assigned to this research program.

Agreement with the State of Oklahoma. The Bureau and the State of Oklahoma entered into a cooperative agreement with a view to improving conditions in the oil industry, to safeguard life among employees, to prevent waste of resources, to increase efficiency in the utilization of petroleum and natural gas.

The experiment station at Bartlesville, Oklahoma, serves as the working quarters for cooperative personnel employed by reason of this agreement. The state allocated to the Petroleum Experiment Station during the fiscal year 1947 a sum not over \$30,405 to be expended in the work of the station in accordance with the objectives of the agreement.

Agreement with Arkansas Oil and Gas Commission. Under the agreement the Bureau of Mines is conducting research to obtain technical facts relating to the behavior of different types of natural petroleum reservoirs under different methods of development and operations in the Arkansas fields. The sum of \$1,200 was provided by the Commission for this work during the fiscal year 1947.

Agreement with the Kansas State Board of Health. Under the agreement the Bureau agreed to supervise and conduct systematic studies of methods for the disposal of oil-field brines and for the use of such brines for secondary recovery of crude petroleum in selected areas in the State of Kansas. The State Board of Health agreed to expend funds for this investigation and make the necessary routine brine and water analyses in their laboratories, and assist in gathering brine and water samples. No specified sum is designated.

Expenditures are made by the Kansas State Board of Health on Bureau of Mines vouchers upon approval by the Director of the Bureau of Mines or his authorized representative.

Agreement with the University of Wyoming. The Bureau of Mines and the University of Wyoming entered into a cooperative agreement with the purpose of making investigations and disseminating information with a view of improving conditions in the oil industry, safeguarding life among oil employees, preventing waste of resources, increasing efficiency and the utilization of petroleum and natural gas. The Bureau of Mines agreed to maintain a Petroleum Experiment Station on the University campus for the purpose of making investigations as assigned to it from time to time by the Director of the Bureau of Mines. The University agreed to provide free of charge suitable and adequate office rooms and laboratories for the experiment station and such laboratory equipment as is available.

Agreement with the Texas Technological College. The Bureau and the College entered into an agreement to cooperate in planning and conducting experiments with regard to well cuttings and core specimens, and such other experiments as may be deemed advisable in connection with these objectives.

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The work under this cooperation is conducted in accordance with plans that are agreed upon from time to time by the representatives of the Bureau and designated members of the faculty of the college. The Bureau agreed to furnish such apparatus as it has on hand for use in the laboratories, and give technical supervision and advice. The college provides facilities suitable to protect the equipment supplied by the Bureau. The results of the findings under the cooperation are available to the representatives of the Bureau of Mines at all times.

Agreement with the Coordinating Research Council. The Bureau and the Council concluded an agreement to cooperate in planning and conducting a study for the purpose of obtaining information regarding the characteristics of gasoline sold to the public through service stations and other retail outlets, according to plans that are agreed upon by representatives of the Bureau and members of the Research Council. The Bureau compiles, tabulates, analyzes, and comments upon the data which the Council furnishes. The semi-annual National Motor Gasoline Surveys are a direct result of this cooperation.

Agreement with the Natural Gas Department of the American Gas Association. The Bureau and the Association agreed to cooperate in planning and conducting an investigation into the causes of freezing of natural gas pipe lines and methods of preventing freezing. This cooperation follows the plans that are agreed upon by representatives of the Bureau and members of the Pipe Line Flow Committee, which is a subcommittee of the Technical and Research Committee of the Association. The Bureau agreed to supervise the investigation, and make available equipment needed in the investigation. The Bureau provides office and laboratory space. For the fiscal year 1947 the Association shall provide a sum of \$2,500 to cover the expenses of the investigation.

Agreement with the Natural Gas Department of the American Gas Association. The agreement between the Bureau and the Association provides for cooperation in planning and conducting an investigation of methods of controlling and gaging oil and gas deliveries from high-pressure combination wells in order to prevent excessive gas waste and damage to wells, and to utilize economically the energy of the gas under pressure in the reservoir.

The Bureau supervises the investigation, supplies the services of such investigators as it can assign from its force, provides working quarters in its offices and laboratories, and makes available such equipment as it possesses. The Association shall provide the sum of \$7,000 to cover the expenses of this work during the fiscal year 1947.

Agreement with the Natural Gasoline Association of America. The Bureau and the Association agreed to plan and conduct an investigation with a view of determining the causes of internal corrosion of well equipment and methods of preventing corrosion which is a menace to life and property.

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The Bureau conducts the research, supplies the services of the engineers, and provides such facilities and equipment as it possesses. The Association shall expend the sum of \$8,000 for the program during the fiscal year 1947.

Agreement with the Pennsylvania Grade Crude Oil Association. The Bureau and the Association concluded an agreement with the purpose of increasing the production of oil and bringing about a more efficient extension of petroleum from underground reservoirs by applied technical research. The Bureau agreed to conduct, supervise, and direct technical research under this cooperation, supply the services of suitable engineers and provide such facilities, instruments and equipment as it possesses for the purpose, and provide office and laboratory space for the work at the Petroleum Field Office in Franklin, Pennsylvania. The Association agreed to expend for the purpose of the contract a sum not to exceed \$4,200 during the fiscal year 1947.

II

Fuels Utilization Division

Organization and Functions. The Fuels Utilization Division consists of the following five sections: Fuel Economy Service to Government Agencies, Fuel Inspection, Boiler Water Research, Boiler Service to Government Agencies, and Cold Storage and Substitution. The oil and natural gas activities are concentrated within three sections: Fuel Economy Service to Government Agencies, Boiler Water Research, and Boiler Water Service to Government Agencies.

The Fuel Economy Service provides fuel engineering service to Government agencies. Its functions are as follows:

(a) The determination of the most economical fuel to be used for boiler plants. Usually such studies are made for proposed plants, although occasionally studies are made for plants already in operations. In arriving at the best choice of fuel, several factors are taken into consideration: Initial equipment and construction costs, labor and maintenance costs, and power and fuel costs. In some cases the choice is fuel oil or gas;

(b) Consulting service on choice of fuel-burning equipment, including the preparation of specifications for new equipment;

(c) Study of bids and recommendations with regard to new equipment. Acceptance tests are frequently made after new equipment is installed;

(d) Plant tests, determination of changes in equipment, training of operators and establishment of cost records;

(e) Recommendations as to purchase of fuel. This work covers the preparation of invitation for bids, including the analytical specifications,

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study of bids received and recommendations for award. The functions of the Boiler Water Research and Boiler Water Service to Government agencies deal with the maintenance of the proper chemical condition of boiler water for the purpose of preventing scale, corrosion, and caustic embrittlement, thus improving efficiency in the use of all fuels. Occasionally the three sections prepare publications pertaining to their activities on natural gas and oil.

III

Office of Synthetic Liquid Fuels

Functions and Organization. The functions of the Office of Synthetic Liquid Fuels is to carry out the provisions of Public Law 290 approved by the Congress on April 5, 1944. The act authorizes the Secretary of the Interior to construct, maintain and operate demonstration plants to produce synthetic liquid fuels from coal, oil shale, and other substances, the plants to be of the minimum size which will allow the Government to furnish industry the necessary cost and engineering data for the establishment of a synthetic liquid fuel industry. The activities include laboratory and development work necessary to determine the best demonstration plant, designs and methods of operation.

The Office is composed of Washington headquarters and six Divisions: Foreign Synthetic Liquid Fuels, Oil Shale Research and Demonstration Plant, Oil Shale Mining, Research and Development, Synthesis Gas Production, and Hydrogenation Demonstration Plant. A gas synthesis demonstration plant is contemplated for the future. Some of the Divisions consist solely of a single Washington office, others have headquarters in Washington and laboratories, plants, or research stations in the field. Still others consist of headquarters outside of Washington with laboratories, plants, or research stations located in places different than those of the headquarters.

Foreign Synthetic Liquid Fuels Division

This Division handles all matters concerning the collection and distribution of information pertaining to liquid fuels, lubricants, and solid fuels obtained by the Bureau of Mines and other investigators on foreign missions. The regular sources of information for the Division are the Army and Navy intelligence groups. The main volume of reports received currently originate from British interrogation of German scientists, and the American Military Government in Germany. Upon receipt of reports of interest, the Division arranges for preparation of microfilms. At the present time there are approximately 225 microfilms, each 100 ft. in length, and containing approximately 1000 pages each. As of the end of October the Division had received 938 reports, some of which are duplicates. A reference library is maintained and the various reports and microfilms are distributed to oil companies and Government agencies. The Division is located in Washington and employs four persons: a librarian and three stenographers. The allotment for the fiscal year 1947 is \$20,000.

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The Foreign Synthetic Liquid Fuels Division cooperates with the Office of Technical Services in the Department of Commerce which is theoretically in charge of all the activities concerning the technical mission reports and domestic research reports. The Division serves as the fuels and lubricants unit of the Office of Technical Services which publishes weekly a bibliography on the research and technical mission reports made available to the public.

Oil Shale Mining Division

The function of this Division is to conduct engineering and economic studies to develop efficient, low cost methods of mining shale, including laboratory studies, experimental mining of oil shale and analysis of mining operations in other types of rocks; to mine oil shale for use in the oil shale-demonstration plant; and to conduct any studies of mining needed in the work or needed in the synthetic liquid fuels program.

The Division consists of (1) headquarters in Denver, Colorado, and (2) Oil Shale Mining Section. An Oil Shale Mining Research Section is contemplated for the future. The headquarters in Colorado employs two persons, and the allotment for the fiscal year 1947 is \$300,000. The Oil Shale Mining Section is located at Rifle, Colorado, and its function is to mine shale for the demonstration plant. It employs six full-time employees and 20 wage board employees, and its allotment is \$300,000 for the fiscal year 1947.

Oil Shale Research and Demonstration Plant Division

The functions of the Division - composed of headquarters in Washington, D.C., and two Sections in the field - are twofold:

1. Conducting fundamental physical and chemical research in connection with the utilization of oil shale, including development and application of methods for determining all properties of oil shale and shale oil; to design, construct and operate engineering laboratory-scale process equipment for the conversion of oil shale into usable products; to serve as a research center for the oil shale demonstration plant.

2. Testing methods of retorting oil shale and of refining/shale oil, and conducting demonstrations of the methods found to be most advantageous. The work is done with units of types suitable for commercial operations. The sink of the equipment allows the Government to furnish industry the necessary cost and engineering data for the development of an oil shale industry.

The research and demonstration work of the Division is performed by the two Sections respectively: The Oil Shale Research and Development in Laramie, Wyoming, and the Oil Shale Demonstration Plant in Rifle, Colorado.

The Division employs 135 full-time employees and 141 wage-board employees, and its expenditure for the fiscal year is \$1,428,514.

Research and Development Division

The Division conducts laboratory research and development work on the production of synthetic liquid fuels from coal, oil shale, and other substances. With pilot plants it makes process and engineering studies to ascertain lowest investment and operating costs, and determines the best demonstration plant designs and conditions of operation. The activities of the Division are conducted at the headquarters located at Pittsburgh, Pa., and seven Sections of which four - the Organic, Technical Reports, Physical Chemistry and Coal Hydrogenation - are located at Pittsburgh, and three - Gas Synthesis, Technical Service, and Engineering Design and Research - are located at Brunston, Pa. The Division employs 218 persons and the allotment for the fiscal year 1947 is \$1,121,440.

Synthesis Gas Production Division

The functions of the Division are to conduct laboratory and pilot plant research and design studies relating to the production of synthetic liquid fuels from gases, including design, construction, and operation of equipment for the production and purification of carbon monoxide and hydrogen from coal, coke, anthracite, lignite and natural gas for conversion to liquid fuels. The Division consists of headquarters in Washington, D.C., and the Synthesis Gas Production Section at Morgantown, West Virginia. The Division employs 28 persons and the allotment for the fiscal year 1947 is \$250,000.

Hydrogenation Demonstration Plant Division

The Division is charged with the design, construction, operation, and maintenance of a coal hydrogenation plant which will enable the Government to furnish industry the necessary cost and engineering data for the development of an American coal hydrogenation industry. The headquarters and several sections of the Division are located at Louisiana, Missouri. The program of the Division received a serious set-back when the Missouri Ordnance Works, which had been made available to the Bureau of Mines as a site for the hydrogenation demonstration plant, was taken back by the War Department on July 26, 1946, for the manufacture of ammonia for fertilizer. As the War Department has stated that it could not promise to make even a portion of the plant available, it may be necessary for the Division to select a new location for the demonstration plant. The Division employs 31 persons and the allotment for the fiscal year 1947 is \$1,765,346.

Cooperative Arrangements

The Office of Synthetic Liquid Fuels is a party to the following cooperative arrangements:

1. Interdepartmental Board of the Departments of the Navy and Interior. The Board, created by the Secretaries of the Navy and Interior, is charged with the coordination of the oil shale and shale oil activities of the two departments.

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2. Agreement with Columbia University. The University's barodynamic laboratory is provided for the use of the Bureau of Mines employees in making tests on oil shale. The Bureau pays the University \$300 per month.
3. Agreement with West Virginia University. The University makes available without charge to the Bureau of Mines laboratory space for research and development work on the production of gases for synthetic liquid fuels from coal.
4. Informal Arrangement with the Geological Survey and the Navy Department. The Bureau of Mines, the Geological Survey and the Navy Department are cooperating in a core drilling program on the Naval Oil Shale Reserves. The Navy has transferred \$17,000 to the Bureau toward the cost of this project.
5. Agreement with the Alabama Power Company. The Agreement pertains to research on gasification of coal in the mine and its principal object is to produce a gas which can be used in the Fischer-Tropsch process for the production of synthetic hydrocarbons. The Alabama Power Company is preparing a mine for this research, and the Bureau will soon begin work on a laboratory.
6. Cooperation with the Department of Agriculture. Activities with regard to production of liquid fuels from agricultural and forestry products are carried out in cooperation with the Department of Agriculture as provided in Public Law 290.

PART 2

Economics and Statistics Branch

Functions. The functions of the Branch are: (a) to organize and supervise the compilation and interpretation of mineral statistics and data on causes and frequency of accidents in the mineral industry; (b) the preparation of economic analysis of production, distribution, consumption, stocks, trends, employment and other factors related to all branches of the mineral industry; and (c) the compilation and analysis of data on foreign minerals.

Organization. The economics and statistics branch is composed of a central office and six Divisions: Petroleum Economics, Foreign Minerals, Accident Analysis, Metal Economics, Non-Metal Economics, and Coal Economics. The activities relating to petroleum and natural gas are centered within two Divisions of the Economics and Statistics Branch: The Petroleum Economics Division, and the Foreign Minerals Division.

I

The Petroleum Economics Division

Functions and Organization. The primary functions of the Division are: (a) to collect current and annual statistics of the supply and demand

for crude petroleum, petroleum products, natural gas and related products in the United States; (b) to assemble data on foreign production of crude petroleum and products and on the international trade in these products; (c) to make economic surveys and studies relating to the regional consumption and users of these products; and (d) to make forecasts of the demand for crude oil by States and determine by an analysis of the demand for products and seasonal changes in stocks.

The Petroleum Economics Division is composed or consists of a central office in Washington employing 14 persons and one field office at Los Angeles, California, employing two persons. The Washington office collects all statistics for areas east of the Pacific Coast district, prepares the chapter for the Minerals Yearbook and all current and special reports on a national basis. The Los Angeles office collects the statistics for the Pacific Coast area and issues a monthly report for that district. Essential data for this area is combined in the national total and published by the Washington office.

Cooperative Arrangements. The Economics and Statistics Branch is a party to cooperative agreements with a number of State agencies for the interchange of data relating to crude petroleum and natural gas.

Scope and Character of Data Collected and Published. The Division publishes the following three groups of data: (a) current reports on crude petroleum and products; (b) annual summaries of crude petroleum and products; and (c) summaries and reports on natural gas and products. In general, data on domestic activities are obtained by coverage of private industry rather than by sampling techniques or by perusal of State records. All information is submitted on a voluntary basis by the industry. In assembling the data the following Federal agencies serve as sources of information: Public Roads Administration, Departments of War, Navy, Commerce, State, Labor, Interstate Commerce Commission, War Shipping Administration, and the Federal Power Commission. The Division subscribes to several foreign publications and reviews for additional data.

(a) Current Reports on Crude Petroleum and Products. To this group of data belong:

1. Monthly Petroleum Statement. The Statement includes: Monthly statistics of crude oil production, stocks, and demand by States of origin; crude runs to stills, refinery output by products, and stocks of refining oils; a balance statement of supply and demand for all oils by products including Commerce Department data on imports and exports of refined products. All information contained in this report is received by questionnaires from operators with the exception of two items, namely, the number of drilling rigs in operation, which figure is taken from the Oil and Gas Journal, and the Price Index for Petroleum and Products, which is taken from the Bureau of Labor Statistics Index.

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2. Crude Petroleum Report by Refineries (Monthly). This is a summary by States showing stocks of crude oil at refineries, runs to stills, and receipts of crude petroleum by states of origin, and by methods of transportation. It is the most detailed report issued on crude oil movements.

3. Weekly Crude Oil Stock Report. The report shows stocks of crude petroleum by States of origin. These data combined with the weekly production figures published by the API, make possible a weekly computation of the demand for crude oil by States.

4. Monthly Forecast Report. The report contains a monthly forecast of the demand for crude oil by States of origin. It was originated with the purpose of supplying information desired by the States in determining their pro rata progress. Longer term quarterly forecasts were initiated in 1946 to show the relationship of crude demand to the demand for products and to seasonal changes in stocks.

5. The Petroleum Situation in the Pacific Coast Territory. This is a monthly report showing the supply and demand for petroleum and products in the five western States: Oregon, Washington, California, Nevada, and Arizona. The report issued by the Los Angeles Office of the Division is prepared differently than similar reports in other parts of the country, owing to the fact that the western industry works more or less as a separate unit.

(b) Annual Summaries of Crude Petroleum and Products. To this group belong:

1. Crude Petroleum and Petroleum Products (Chapter - Minerals Yearbook). It contains an annual summary of all monthly data and information on crude oil reserves; detailed production data by States; value of crude oil at the wells; refinery capacity; data relating to the consumption of oil products by States and users, and world production of crude petroleum.

2. Asphalts and Related Bitumens (Chapter - Minerals Yearbook). The chapter contains data on the production and uses of the petroleum asphalt and native asphalt and bitumens.

3. Special Annual Surveys (Mineral Market Reports). Two annual surveys belong under this heading: "Sales of Fuel Oil and Kerosene," which is an analysis of distribution by States and major users; and "Sales of Liquefied Petroleum Gases," which is an analysis by types and uses of liquefied gases derived from refineries and natural gas and cycle plants.

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(c) Summaries and reports on natural gas, natural gasoline, and carbon black. Data on natural gas are given by the following: "Nature and Development of Bureau of Mines Statistics on Production and Uses of Natural Gas," and the "Annual Review of Natural Gas," which is a chapter in the Minerals Yearbook and summarizes production, distribution, value and uses by States.

Data on natural gasoline are presented by a "Monthly Natural Gasoline Report," which summarizes production, distribution, and stocks of the products originating at natural gasoline and cycle plants, and the Annual Summary - Natural Gasoline and Liquefied Petroleum Gases, which is a chapter in the Minerals Yearbook and contains a summary of monthly reports, data on value and additional information on distribution and uses.

Information on carbon black is given by the Annual Review -- Carbon Black, which is a chapter in the Minerals Yearbook and contains data on production, stocks, uses and value.

Foreign Minerals Division

The functions are: To compile and analyze data on foreign mineral industries, including resources, production, international trade, markets, commercial and political control and mining laws; to assist the Department of State in technical direction of its Mineral attaches and mineral reporting services from foreign offices. The program of the Division provides information required by domestic industries seeking foreign markets for mineral products, or for supplies of raw materials, or opportunities for investment abroad. The data are also required by Government agencies concerned with foreign policy, tariff, and war procurement. The Division employs two people. Through the Economics and Statistics Branch of the Bureau of Mines, the Division has made arrangements with the State Department to secure information on foreign oil developments from petroleum attaches and consular service. The Division issues data on world production of crude petroleum, international trade and prices. The data are published in (a) "International Petroleum Trade," which is a monthly containing data on production of crude petroleum and products; imports and exports by countries; and notes on new developments; and (b) "The World Retail Prices and Taxes on Gasoline, Kerosene and Motor Lubricating Oils," a quarterly which summarizes available world data on the enumerated subjects.

PART 3

Health and Safety Branch

Functions and Organization. The functions of the Branch, as outlined in the Organic Act of 1910, amended in 1913, are:

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(a) "... to conduct inquiries ... concerning mining and the preparation, treatment, and utilization of mineral substances with a view to improving health conditions and increasing safety ... in the mining, quarrying, metallurgical, and other mineral industries;"

(b) To "prepare and publish ... reports of inquiries and investigations ... concerning the nature, causes, and prevention of accidents, and the improvements of conditions, methods, and equipment, with special reference to health, safety ... in the mining, quarrying, metallurgical and other mineral industries; the use of ... safety methods and appliances, and rescue and first-aid work in said industries; ..."

The Health and Safety Branch is composed of three units: Health Division, Safety Division, and Coal Mine Inspection Division. Petroleum and natural gas activities are confined to the Health and Safety Divisions.

HEALTH AND SAFETY DIVISIONS

Specific Activities. The principal activities of the two Divisions with regard to the petroleum and natural gas industry are as follows:

1. Conducting training courses in first aid. The courses are given free of charge to employees of any oil company requesting the service.
2. Conducting courses in accident prevention in the production and processing of petroleum and its products.
3. Lecturing and conducting demonstrations on the causes of fires and explosions before employees of the petroleum industry and consumers of petroleum products.
4. Lecturing and conducting demonstrations on health and safety hazards of gases and other products of the industry.
5. Conducting training courses in and lecturing and demonstrating on the use and limitations of respiratory equipment tested and approved by the Bureau of Mines for protection against the inhalation of toxic gases and dusts encountered in the production and processing/petroleum. All of the appliance testing is performed in the Pittsburgh Laboratory.
6. Investigating causes of accidents due to the use of explosives in the petroleum industry and advising as to safe storage and use of explosives.
7. Laboratory and field studies on toxicity and explosibility of gases and dusts encountered in the production, processing, and use of petroleum and its products.
8. Issuing publications on the foregoing activities.

Field Offices and Estimated Expenditure. For administrative purposes of the Health and Safety Branch, the continental United States is divided into eight districts (A, B, C, D, E, F, G, and H), each under a field office. The field offices are located at: Pittsburgh, Pa; Wilkes-Barre, Pa; Mount Hope, W. Va; Birmingham, Ala; Vincennes, Ind; Duluth, Minn; Dallas, Tex; and Salt Lake City, Utah. Each of these offices is engaged to some extent in safety activities pertaining to the petroleum and natural gas industry.

The estimated annual expenditures of the Health and Safety Division are between \$25,000 and \$50,000.

Cooperative Agreement. The Health and Safety Branch has an agreement with the American Red Cross to the effect that the latter is giving first-aid courses to the non-mining industries. Under the agreement the petroleum refining industry is considered a mining industry.

PART 4

Office of Minerals Reports

The Office of Minerals Reports directs informational activities of the Bureau of Mines. It consists of three Sections: Editorial, Information and Motion Pictures. Each of these Sections is engaged to some extent in informational activities pertaining to petroleum and natural gas. Of importance is the Motion Pictures Section.

The Section cooperates with oil companies in the preparation of films pertaining to practically all phases of the petroleum industry including prospecting, production, refining and distribution. The cooperation expresses itself in supervision of the production of the above films. Private petroleum companies pay all expenses of the films and select the film company to perform the work of the photographing, developing, assembling, titling, printing, and all other details incidental to the making of a completed film. During the fiscal year 1946 the petroleum industry appropriated \$145,000 for production of motion pictures.

The Section is supplied with approximately 100 to 150 copies of each film. The films are loaned free of charge by the Section to educational institutions, training classes, engineering and scientific societies, civic and business associations and other organizations. The main distribution center for the films is the Bureau of Mines Experimental Station at Pittsburgh, Pa. The borrower is required to pay transportation charges both ways as well as for loss or damage other than ordinary wear and tear.

No Government funds have been used for the production of the films or in providing copies for distribution. The only cost to the Government in connection with the entire mineral motion pictures program is the salary of the Supervising Engineer of the Motion Pictures Section, part-time cost of stenographic help, and part-time cost of personnel in the Pittsburgh Laboratory.

REPORT ON ACTIVITIES OF THE GEOLOGICAL SURVEY,
MINISTRY OF THE INTERIOR, WITH REGARD TO
PETROLEUM, NATURAL GAS AND RELATED HYDROCARBONS.

INTRODUCTION

Creation

The Geological Survey was established in the Department of the Interior in 1879 (Title 43, U. S. C. March 3, 1879).

Purpose

The Geological Survey is primarily a fact-finding agency which collects, distributes, and makes available information about the mineral and water resources of the Nation. The Geological Survey conducts research in geology and related fields, prepares and distributes topographic maps, classifies public lands as mineral or nonmineral in character, and supervises prospecting and development operations for minerals on leased public lands, Indian lands, lands acquired by the United States through purchase, gift, exchange, or otherwise, and on the naval petroleum reserves.

Organizational Outline

The Director as the chief executive has charge of all activities. There are four operating branches: Geologic, Conservation, Water Resources, and Topographic. Two of these, namely, the Geologic and Conservation Branches, perform functions dealing with oil, natural gas, or related hydrocarbons.

Attached to the Director's office is an administrative geologist who, among other duties, supervises the work of the Chief Clerk, the Distribution Division, Accounts Division, and the Library. Also in the Director's office is a Staff Scientist for Territories and Island Possessions.

The legal aspects are handled by a small staff in the office of the Chief Counsel of the Geological Survey.

The various functions and activities of the Survey bearing on oil and natural gas are described under the following three headings: (1) Geologic Branch, (2) Conservation Branch, and (3) Legal Activities.

PAGE 1

GEOLOGIC BRANCH

Primary function

The primary function and responsibility of the Geologic Branch is to map and interpret the geology of the continental United States and Alaska.

in this mapping and interpretation of the geologic features of all parts of the country, all obtainable geologic evidence is acquired by direct observation or by geophysical measurements of the rocks at the surface and to depths of several miles below the surface. Knowledge of the conditions under which the rocks were formed and the basic data concerning their character, thickness, and distribution, are necessary for the development and utilization of the Nation's mineral resources. Since the organization of the Geological Survey in 1879, it has been engaged in the study of geologic conditions throughout the country, and the results of its studies are available for reference in thousands of maps, books and articles. These publications are the principal standard reference works on the geology of the country. Although these publications, together with those prepared under State and private auspices, provide much fundamental information, there are large areas in which relatively little is known of their geologic features, and for the greater part of the country detailed knowledge of the geology is lacking. The full appraisal of the potentialities of our mineral resources will not be known until detailed knowledge of the geologic conditions controlling their occurrence has been obtained.

Organizational Outline

The Geologic Branch consists of two divisions: the Economic Geology Division, and the Areal Geology and Basic Sciences Division.

The Economic Geology Division includes five sections: the Metals Section, Non-Metals Section, Alaskan Section, Fuels Section, and Section of Foreign Geology.

The Areal Geology and Basic Sciences Division consists of the Sections of Petrology, Chemistry and Physics, Paleontology and Stratigraphy, Engineering Geology, Geophysics and Areal Geology, and the Military Geology Unit.

Activities of the Geologic Branch Pertaining to Oil, Gas, and Related Hydrocarbons

Oil, gas and related hydrocarbons occur in rocks of the earth's crust and have been discovered at depths as great as 2-1/2 miles. They occur in pore spaces and other cavities in the rocks where geologic factors are favorable for their entrapment. Their occurrence is controlled by such geologic factors as the conditions of deposition of the rocks, the presence therein of source material, the physical characteristics of the rocks including porosity and permeability, and the presence of structural or stratigraphic traps that arrest the movement of the fluids and gases and are responsible for accumulations that can be developed and utilized. The acquisition of knowledge of these geologic factors in the greatest possible detail is the first step in the search for new sources of oil and gas. Also, knowledge of these factors involves regional knowledge of the entire geologic history of potential producing areas.

The activities of the Geologic Branch relating to petroleum, natural gas and related hydrocarbons are centered in the Fuels Section and Alaskan Section of the Economic Geology Division. Except for a small part of the work of the Section of Geophysics, the Areal Geology and Basic Science Division has no direct functions with regard to oil, gas, or related hydrocarbons. The Sections of that Division chiefly perform work of a technical, consultative nature: scientific identification of fossils, petrographic and chemical analysis, and the like.

The purposes of the programs of the Geologic Branch units performing activities pertaining to oil, gas and related hydrocarbons are: (1) The acquisition of complete knowledge in three dimensions of the thickness, character, distribution, and correlation of the oil- and gas-bearing rock units and associated rocks of the earth's crust to all depths accessible by drilling in productive and potentially productive oil and gas territory; (2) the accumulation of maximum information as to the factors controlling the origin, accumulation, and entrapment of petroleum and natural gas in the reservoir rocks with a view to disclosing clues as to new methods to apply to the research for these substances and to supplying the basic geologic information to facilitate the most efficient extraction.

In its essence these programs are a scientific research enterprise requiring not only intimate coordination between field geologists and specialists in the fields of paleontology, petrology, geochemistry, and geophysics, but also the existence of closely coordinated facilities for processing, photolithography and printing of the results for public distribution and sale.

(1)

Fuels Section

Activities

The bulk of activities of the Fuels Section is centered on petroleum, natural gas, oil shale, and bitumen. This Section (1) investigates the areal, structural, stratigraphic, and economic geology of the above named mineral fuels and helium; (2) conducts research in problems of the origin of petroleum and natural gas; (3) supplies (a) information for exploration in undeveloped areas, (b) information on the resources of these fuels, and (c) information on these fuels on the public lands for classification purposes.

These activities are closely coordinated with the fields of other Sections of the Geologic Branch which deal primarily with paleontology, stratigraphy, chemistry, physics, geophysics, mineralogy, and petrology.

Organization

The geologic investigations relating to oil, gas and related hydrocarbons are administered by the Fuels Section from a central office in Washington, D. C. Plans for projects are formulated through conferences of members of the Washington staff with field geologists and with officials of state geological organizations and representatives of the petroleum industry. The field geologists carry on investigations in twenty or more states. In some states they operate without formal office facilities, in others they operate from field offices of the Geologic Branch or offices provided by the geological organizations of states or universities. Field work is supervised by periodic visits of members of the Washington staff. Reports presenting results of the field investigations are reviewed either in Washington or in the field. Final editing and processing of the reports for publications are handled in Washington. The Fuels Section employs between 70 and 80 people, two-thirds of whom are professional. The remaining one-third consists of sub-professional and clerical employees.

Activities are financed chiefly by direct appropriation from Congress, amounting for the present fiscal year to about \$380,000.

(2)

Geophysics Section

Organization and Activities

The Section is organized along functional lines consisting of five tentative units: Magnetic, Electrical, Gravimetric, Seismic and Geothermal. The organization of the Section is still in the formative process. The activities of each Unit are as follows:

Magnetic Unit. - The work of the Magnetic Unit is divided into airborne and ground. Practically none of the ground magnetic work is devoted to oil and gas, the reason being that this particular field is amply covered by commercial enterprise. As to the aerial magnetometer work, the Survey is now employing one full airplane crew, including the necessary ground staff. Last summer approximately one-half of the total activities of the aerial magnetometer have been on oil and gas. Future plans, however, include minor oil and gas activities with emphasis being placed on general geological data, and exploration for metals.

The airborne magnetometer's chief value is for large scale surveys to obtain preliminary geological information; it should not ^{be} considered as a tool for finalized geologic work. Aeromagnetic surveys are usually supplemented by intensive ground surveys.

Electrical Unit. - Only about 15% of the activities of this Unit is devoted to oil and gas, the activities consisting of determination of the probable extensions of oil bearing sands. Most of this work is done

for the Bureau of Mines on a re-pay basis. One professional and two sub-professional men devote part of their time to these activities on which an estimated \$5,000. will be expended.

Gravimetric and Seismic Units. - These two Units perform no functions with regard to oil, gas or related hydrocarbons. Gravity meter as well as seismic activities required by the petroleum industry are carried out by commercial companies.

Geothermal Unit. - The geothermal activities are limited to a study of temperature gradients within the earth in various parts of the country. The data produced are of only general use to the oil and gas industry.

Staff and Appropriations. - The entire staff consists of 48 people. The Baltimore office has 28 employees: 7 professionals, 17 sub-professional machinists and draftsmen, 3 clerks, 1 janitor. The Washington office consists of 8 professionals and 12 sub-professionals and clerks.

For the current fiscal year the appropriation for the Geophysics Section amounts to \$240,000. of which an estimated \$55,000. will cover the expenditures for the oil and natural gas activities.

(3)

Alaskan Section

Functions and Funds

The Alaskan Section has the responsibility of studying, appraising, mapping, and reporting on all mineral resources of Alaska, including petroleum. These functions are financed each year by a direct appropriation amounting in fiscal year 1947 to \$200,000.

The petroleum work carried on by the Alaskan Section falls into two main categories: (1) Activities performed with funds allocated for the oil program which amounts to \$53,200. in the fiscal year 1947; (2) activities performed with funds transferred from the Navy Department amounting to \$270,900. in the fiscal year 1947. The Navy Department has an appropriation of approximately \$9,000,000. to carry on the petroleum activities on Reserve No. 4 through the year 1950.

The petroleum program supported by appropriated funds comprises three current projects: (1) Continuation of a study of the oil possibilities of the Iniskin-Chinitna district on the west shore of Cook Inlet; (2) continuation of investigation of the oil possibilities in the Katalla-Yakutaga area in the Gulf of Alaska region; and (3) studies of oil possibilities in the vicinity of the Sagavanirktok River in northern Alaska east of Naval

Petroleum Reserve No. 4. The Alaskan Section has no field offices or stations for handling the oil and gas work financed by the appropriated funds, and office and laboratory work connected with this program is done in the offices and laboratories in Washington, D. C.

The Alaskan Section's activities performed for the Navy Department pertain to the Navy Department's program of exploration for oil in the Naval Petroleum Reserve No. 4, and it includes the following: (1) The part-time services of the Director of the Geological Survey as a member of the Operating Committee. This Operating Committee for Naval Petroleum Reserve No. 4 is set up by Secretaries of the Interior and Navy to act as a Board of Directors for the operations. Besides the Director of the Geological Survey, the Committee consists of the Director of the Naval Petroleum Reserves, a representative of the Bureau of Yards and Docks, a representative of the firm of De Golyer and McNaughton (the firm performs advisory duties to the Secretary of Navy), and a representative of the contracting firm for the Navy, known as "Arctic Contractors," - the Army-Navy Petroleum Board is informally represented; (2) the work of an office and laboratory in Fairbanks, Alaska, established in 1945 to conduct business related to the Section's part in the Navy Department's program of exploration for oil in Petroleum Reserve No. 4. This field station serves as a supply and storage point for parties in northern Alaska, and is the temporary center of operations for the supervisor of the Survey's program and for the Advisor to the Naval Officer in Charge of Operations. The laboratory is maintained to supply all the field work that is done pertaining to the Reserve. It has facilities for core analysis, heavy-mineral analyses, chemical analysis, thin-section studies, fossil identification, and the correlation of data with other geological and geophysical information; (3) laboratory investigations in Washington; (4) the services of a geological advisor to the Naval Officer in Charge of Operations in Fairbanks; (5) stratigraphic and structural studies in various parts of the Naval Petroleum Reserve No. 4; (6) airborne magnetometer surveys, and planimetric and topographic mapping of pertinent parts of the Reserve No. 4.

The personnel of the Alaskan Section assigned to this work includes a variable number of technical men (averaging about a dozen) and field assistants.

There are the following arrangements with the Navy Department for the work pertaining to the Naval Petroleum Reserve No. 4: (1) The inter-departmental agreement as resubscribed to by the Interior and Navy Departments on July 1, 1945, which is an "Administrative Agreement between Navy and Interior Departments superseding agreement of February 1, 1934, prescribing and defining the relationship and functions of the Navy and the Geological Survey in the administration and supervision of lands embraced within the Naval Petroleum Reserves; and other related matters"; (2) the letter of December 24, 1945, from the Acting Secretary

of the Navy to the Secretary of the Interior; (3) the reply of January 10, 1946, from the Secretary of the Interior to the Secretary of the Navy; (4) the letter of June 3, 1946, from the Director of the Geological Survey to the Director of Naval Petroleum Reserves; (5) the reply of June 4, 1946, from the Director of Naval Petroleum Reserves to the Director of the Geological Survey.

(4)

Collaboration Between the Geologic
Branch and Other Agencies of the
Federal Government

Applications of geology enter to different degrees into the functions of other Federal agencies dealing with problems relating to oil and gas, such as the Bureau of Mines, the Securities and Exchange Commission, the Federal Power Commission, the Department of Justice, and others.

Many of these applications are relatively insignificant and are handled on an informal basis. The Securities and Exchange Commission and the Federal Power Commission, for example, utilize all available geologic information in making their findings on the specialized problems before them for consideration and thus draw freely upon the published work of the Geologic Branch. On occasions geologists attached to the staffs of these agencies have consulted personally with members of the professional staff of the Fuels Section to locate unpublished file data, or to draw upon the personal geologic knowledge of individuals familiar with the geologic conditions in certain areas.

Somewhat more formal utilization of the knowledge of the Geologic Branch on geologic problems relating to oil and gas is made by request from other agencies of the Federal Government. Such special investigations by the Branch are usually made on the basis of full re-pay of salaries and expenses of the personnel assigned to the project. E.g., in February 1945, the Department of Justice requested the assignment of a geologist of the Fuels Section, and a member of the staff of the Conservation Branch to "make a study of the existence of oil, gas, and other minerals ... for the preparation of appraisal data concerning the market value of such land ..." in connection with condemnation proceedings relating to the acquisition of land for government purposes. Compensation to the Geological Survey for salary, subsistence and travel expenses was provided for in the agreement subsequently made, and the work was performed as planned.

The Geological Survey has cooperated repeatedly in the past with the Bureau of Mines in geologic problems relating to their technologic investigations such as the development of helium supplies, the experimental exploitation of oil shale, and the investigations of oil and gas field reservoir development.

PART II

CONSERVATION BRANCH

(1)

Mineral Classification Division

Functions

The main responsibility of the Division is to determine and certify for a wide variety of administrative purposes whether Federal (public and acquired) or Indian lands are valuable for mineral, either metalliferous or nonmetalliferous, or are potentially valuable for such mineral. The Division prepares surface and subsurface geological maps and determines the areas, fields, or pools logically subject to unitization. It also determines the limits of known producing structures and of individual oil and gas deposits for the purpose of leasing prospective oil and gas lands on a competitive or noncompetitive basis and of determining applicable royalty schedules necessary for the proper administration of the Mineral Leasing Act, and serves as geologic adviser to the supervisors of the coordinate Oil and Gas and Mining Divisions of the Conservation Branch.

Organization

The Division employs 20 people. The Washington office, which directs the regional offices, consists of the Chief of Division, two geologists, one draftsman, and two clerks. Approximately \$140,000. of the appropriation to "Classification of Lands" will be expended by this Division this fiscal year. Regional offices are located in Denver, Colorado; Los Angeles, California; Great Falls, Montana; Tulsa, Oklahoma; and Roswell, New Mexico (opened December 15). A map of the region is attached for convenience in identifying the areas allotted to each office. The field organization makes limited geological investigations and wherever possible draws on the work of the Geologic Branch.

Last year the Division handled 12,000 land classification cases. Upon receipt of a request for classification, the Washington office classifies the land on the basis of available information. If information with respect to a particular tract is not available, the Washington office directs the appropriate field office to obtain the necessary data. At present there is a backlog of approximately 3,000 requests for land classification.

In the past, Federal Agencies - the War Department, National Housing Authority, and War Assets - have asked for surveys and recommendations on the mineral potentialities of lands under their jurisdiction. This work

was performed on a reimbursable basis. The Division expects an increase of activities requested by Federal Agencies owing to the laws concerning fissile materials.

(2)

Oil and Gas Leasing Division

Functions

The activities of the Division include: The supervision of operations for the prospecting, development, and production of oil and gas on Federal, semi-Federal, and Indian lands subject to the various mineral leasing laws; the analysis and approval of development plans and operating procedures; the visiting and inspection of leased properties to assure orderly and efficient development; the maintenance of proper records of production; the determination of the royalty liability of each producer (the operator of the well may appeal any of the regulations imposed by the field engineers to the Director of the Geological Survey, to the Secretary of the Interior, and the Attorney General; however, this procedure is rarely invoked); the maintenance of a consultative engineering service for the benefit of operating companies unable to maintain and support such services; the periodic estimation of petroleum reserves in public land holdings for departmental use; the enforcement of Federal regulations to assure orderly development, best engineering practices, prevention of waste, and safety and welfare of workmen; the accumulation and correlation of stratigraphic, geologic, and production records for use in engineering studies; the study and development of improved production techniques to assure optimum production rates and maximum recovery of oil with the minimum expenditure of reservoir energy; the analysis of oils, gases, waters, cores, etc.; and the preparation of maps and reports for public information describing the results of the foregoing investigations.

An increasingly important function is the preparation, promulgation, and recommendation for final approval of unit agreements and operations incident thereto. The function requires cooperation with lessees, operators, and state supervisory officials, so that the vested interests of all parties will be protected and the unitized substances will be produced without waste. Provisions are included that will assure the greatest ultimate recovery.

Personnel and Funds

The Division has 113 technical and non-technical employees and the 1947 fiscal year funds allotted for such work, exclusive of administrative salaries and expenses and certain related but intangible costs of the Washington office, amount to \$513,539. This figure includes \$473,539. for salaries, \$20,000. of which is a transfer fund from the Navy Department, and \$40,000. for equipment, supplies, office rent, etc. in the field.

Field Offices

Attached is a sketch map showing the location of each field office. A tabulation showing the number of personnel assigned to each regional office is as follows:

<u>Region</u>	<u>Personnel</u>	<u>Salaries</u>	<u>Miscellaneous Expense, etc.</u>
Northwestern	36	\$141,000.	\$14,000.
California	27	111,000.	10,000.
Southwestern	17	69,000.	6,500.
Mid-Continent	28	111,000.	5,000.
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	108	\$432,000.	\$35,500.

An additional \$4,500. is assigned to the above regional offices for rent, automobiles, etc.

Cooperative Arrangements

Operations for the development and production of oil and gas from all Indian land leases, except those of the Osage Nation in Oklahoma, are supervised under a cooperative agreement with the Office of Indian Affairs. Supervision of the Naval Petroleum Reserves, except a portion of Reserve No. 1, is effected under an agreement with the Navy Department.

PART III

LEGAL ACTIVITIES

Organization

The legal aspects of the petroleum and natural gas functions performed by the Geological Survey are handled by a legal staff consisting of a Chief Counsel, Assistant Chief Counsel and one secretary.

Functions

Approximately one-third of its activities deal with problems of petroleum and natural gas, and practically all of these are connected with the functions of the Conservation Branch of the Geological Survey. The main lines of the activities dealing with petroleum and natural gas are as follows:

- 1) Participation in the final negotiation of unit agreements, submitted by an oil company having the principal interest in the oil field. The proposal is submitted through the field office to the Director of the Survey in Washington. Upon consideration of the proposed unitization plan, the Chief Counsel, the representatives of the Conservation Branch, and the prospective lessee negotiate a preliminary agreement. It is estimated that there are about 125 unit agreements covering Federal lands and approximately half of the petroleum produced.
- 2) Processing of litigation cases. In a case of litigation, the Chief Counsel prepares the necessary papers for the Solicitor's Office which submits the case to the Lands Division of the Department of Justice. The Chief Counsel and the Solicitor's Office assist the Department of Justice by furnishing any additional information required.
- 3) Processing of appeals. A lessee may appeal the decision of an oil and gas supervisor of the Oil and Gas Leasing Division to the Director of the Geological Survey. The Chief Counsel reviews the decision for the Director. The lessee may appeal the Director's decision to the Secretary of the Interior in which case the decision is prepared by the Solicitor's Office.
- 4) Preparation of proposed legislation.
- 5) Interpretation of new legislation and departmental orders.
- 6) Participation in preparation of inter- and intra-departmental memoranda of understandings.

December 12, 1946.

REPORT ON ACTIVITIES OF THE BUREAU OF LAND MANAGEMENT, WITH
REGARD TO PETROLEUM, NATURAL GAS AND RELATED HYDROCARBONS

Introduction: Authority and Organizational Outline of the Bureau of Land Management. The authority of the Bureau is based on the President's Reorganization Plan No. III, effective July 16, 1946, which created the Bureau in the Department of the Interior by merging the General Land Office, established in 1812, and the Grazing Service, formed in 1934.

In its functions as the manager of public domain in continental United States and Alaska, the Bureau administers the mining, mineral leasing and homestead laws, supervises the Federal range, conducts surveys, classifies lands as to proper uses, and in general is responsible for matters involving the public lands. The basic objectives of the Bureau are the conservation, proper utilization and disposal of the natural resources of the public domain. It also has jurisdiction over minerals in certain acquired lands. In addition, the Bureau acts as a disposal agency for surplus real property in the United States and Territories assigned to it by the War Assets Administration. In the fall of 1946 the Bureau has been subjected to a reorganization to effect decentralization and improve the public service. Accordingly, as of November 18, 1946 the Bureau is constituted of seven regional offices including one in Alaska. The Washington office is comprised of a Director, who is chief executive, Associate Director and Assistant Director; and six branches: Land Classification and Planning, Adjudication, Engineering and Construction, Range Management, Timber and Resource Management, and Administration. The other six regional offices with headquarters respectively in Portland, Oregon; San Francisco, California; Salt Lake City, Utah; Billings, Montana; Albuquerque, New Mexico; and Anchorage, Alaska, are counterparts of the Washington office in general set-up, and they have supervision of all bureau activities in their respective regions. The organization of the Bureau is still in a formative state with changes, especially in the field organization, in process of development.

Because the reorganization is still in process, the functions of the Bureau of Land Management pertaining to petroleum and natural gas will be presented within the Organizational frame before the decentralization order of November 18, 1946 became effective.

Organization and Principal Functions. The functions bearing on petroleum, natural gas and related hydrocarbons are performed by (1) the Director, the Law Division, and two Branches of the Bureau in Washington: the Branch of Adjudication and the Branch of Administration; and (2) a number of field offices. The two Branches consist of several Divisions each. The oil and gas activities are centered largely within the Minerals Division (N) of the Branch of Adjudication.

The principal functions relative to petroleum and natural gas performed by the above-mentioned offices in Washington and in the field stem from the administration of oil, natural gas and shale deposits in the public domain in the continental United States and Alaska under the Mineral Leasing Act of February 25, 1920, as amended (30 U.S.C. 226). The public domain comprises approximately 413,000,000 acres in continental United States, and approximately 365,000,000 acres in Alaska.

In addition to functions under the Mineral Leasing Act, the foregoing offices of the Bureau of Land Management are charged with the following responsibilities:

(a) Leasing oil and natural gas deposits, including other mineral deposits, in acquired lands under the jurisdiction of other bureaus and agencies of the Department of the Interior (Dept. Order 2223, July 11, 1946);

(b) Leasing oil and natural gas deposits, including other mineral deposits, on certain other acquired lands where the functions with respect to the mineral deposits of such lands have been transferred from the Secretary and the Department of Agriculture to the Secretary of the Interior (Sec. 402, Reorganization Plan No. 3 of 1946, July 16, 1946, 11 F.R. 7875; 43 CFR 4.261). These transferred lands comprise approximately 27,000,000 acres, and for the present, for the purpose of leasing these lands, the regulations formerly governing the leasing of these lands by the Department of Agriculture have been adopted with such changes as were necessary, pending the issuance of new regulations by the Bureau of Land Management. According to the Memorandum of Understanding between the Bureau of Land Management and the Department of Agriculture of November 8, 1946, before a lease can issue for any tract of Agriculture Acquired Lands, the consent of the Department of Agriculture must be obtained and any lease that may issue must contain any stipulations prescribed by the Department of Agriculture for the protection of surface use.

(c) Leasing, or recommending the execution of compensatory royalty arrangements, with respect to all acquired lands, where jurisdiction over the oil and gas deposits of such lands have been transferred from other departments to the Secretary of the Interior (e.g. Executive Order 9087, March 7, 1942, 7 F.R. 1743).

There are two kinds of oil and natural gas leases issued by the Bureau of Land Management: (1) Leases in wildcat areas, which are sometimes referred to as permits or prospecting leases, and (2) leases on known producing structures. With regard to the first type of lease the terms of payment are fixed. In respect to the second type the terms of payment are negotiated by bids, if the leases are offered for sale by competitive bidding, otherwise the terms of payment of rentals and royalties are fixed in the lease.

Specific Activities of the Washington Offices. Backlog and Expenditures. Towards effectuation of the principal functions of the Bureau of Land Management relative to petroleum and natural gas the activities of the Washington offices are as follows:

(1) The Office of the Director renders final determination on all important matters arising in connection with the administration of oil and natural gas leasing; executes all oil and gas leases, and approves assignments thereof on behalf of the United States.

(2) The Law Division -- which serves all branches of the Bureau -- reviews oil and gas legal questions adjudicated by the Minerals Division; surveys and recommends enactment of any necessary legislation affecting Federally-owned petroleum and natural gas deposits; reviews and initiates regulations to be promulgated in connection with such deposits.

The current work load is approximately 50,000 items annually. Because of accumulating backlogs in adjudication work of the Bureau, the Law Division faces a greater volume in 1948.

(3) The Minerals Division of the Branch of Adjudication ^{1/} takes action with respect to application for, the issuance, sale, and cancellation of petroleum and natural gas leases; collects rentals, royalties and other monies due in connection with leasing; takes action with respect to approvals of assignments, operating agreements and sales contracts entered into by lessees of Federally-owned oil and gas deposits. It also prepares decisions for the signature of the Director of the Bureau, recommends enactment of necessary legislation and assists in preparation of administrative regulations.

The Minerals Division is confronted with a serious situation. Approximately 48,000 units of work are received into the Division each year, leaving 32,000 of the current flow of business which cannot be handled under present conditions.

(4) Within the Branch of Administration -- which serves all branches of the Bureau of Land Management -- Division D maintains a mailing and filing system on all oil and gas cases; Division O posts applications, withdrawals, etc., on the tract books, and surveys such books for possible conflicts which may preclude issuance of an oil or gas lease for certain areas; Division E maintains a system of accounts, enabling a careful check on the financial obligations of the petroleum and gas lessees.

^{1/} While the principal petroleum and natural gas activity of the Branch of Adjudication relative to petroleum and gas is leasing oil and gas deposits on the public domain and certain other lands, it also performs functions of granting oil and natural gas rights-of-way on the public domain. Furthermore, the Branch of Adjudication may also grant rights-of-way with regard to lands, jurisdiction over which lies with agencies composing the Department of the Interior (e.g. Office of Indian Affairs). The function of granting rights-of-way is handled by the Reclamation and Land Grants Division of the Branch of Adjudication. Rights-of-way are usually granted on a basis of 50-year renewable leases. The standard rental is \$5 per mile per year. Special leases are negotiated for the ground required for pumping stations, terminals, etc. About 25 applications for oil and gas pipe line rights-of-way are received each month. The average time of processing an application is 3-6 months. An oil or natural gas pipe line constructed on Government lands must be operated as a common carrier.

For the fiscal year ending June 30, 1946 approximately 85 man years, totalling roughly less than \$300,000 in expenses, were devoted to oil and gas activities in the Washington offices. The major portion of these expenditures was incurred in connection with oil and gas leasing activities under the Mineral Leasing Act.

Activities of the Field Offices, their Personnel, Location, Salaries and Expenses. Applications for oil and natural gas leases, as well as bonds, assignments, and payments submitted in connection therewith, are ordinarily filed in the district land offices. After preliminary processing to ascertain whether the applicant has conformed to the major requirements of the law, the applications are forwarded to the Washington office for further appropriate action. The current decentralizing reorganization of the Bureau of Land Management aims to empower the respective district land offices to render final decisions on oil and gas lease applications.

The district land offices which devote a considerable, or major portion of their time to oil and gas leasing activities and the number of their employees, salaries and expenses are as follows:

	<u>No. of Employees</u>	<u>Salaries and Expenses</u>
Los Angeles, California	4	\$18,000
Sacramento, California	5	21,000
Denver, Colorado	4	12,000
Pueblo, Colorado	3	9,000
Billings, Montana	3	8,000
Great Falls, Montana	4	11,000
Carson City, Nevada	3	8,000
Las Cruces, New Mexico	6	16,000
Santa Fe, New Mexico	4	12,000
Salt Lake City, Utah	5	13,000
Buffalo, Wyoming	3	9,000
Cheyenne, Wyoming	6	15,000
Evanston, Wyoming	2	9,000
Total	<u>52</u>	<u>\$161,000</u>

The district land offices engaged on a much smaller scale in oil and gas leasing activities are located in Phoenix, Arizona; Blackfoot, Idaho; Bismarck, North Dakota; Pierre, South Dakota; Roseburg and The Dalles, Oregon; Anchorage and Fairbanks, Alaska.

Revenues. The Bureau of Land Management collects rentals and royalties in connection with its issued mineral leases, licenses and permits. As indicated by the table below, total receipts for the fiscal year 1946 were \$11,119,186.20. Of this sum, \$9,323,130.25, or approximately 84% were oil and gas revenues.

Receipts from Mineral Leases, Licenses,
and Permits, Fiscal year 1946.

<u>Type of Mineral</u>	<u>Mineral Leasing Act of 1920</u>	<u>Other Acts</u>	<u>Total</u>
Oil and Gas	\$9,102,734.16	\$220,396.09 ^{a/}	\$9,323,130.25
Coal	911,860.48	18,098.48 ^{b/}	929,958.96
Phosphate	15,623.95	-	15,623.95
Potash	-	846,120.63 ^{c/}	846,120.63
Sodium	1,029.00	-	1,029.00
Silica Sands	-	3,323.41 ^{d/}	3,323.41
Total -	\$10,031,247.59	\$1,087,938.61	\$11,119,186.20

^{a/} Act of June 12, 1926, \$7,507.45; act of June 26, 1926, \$24,692.16;
Executive Order 9087, \$188,196.48.

^{b/} Alaska coal leasing act.

^{c/} Act of October 2, 1917, \$56,483.17; act of February 7, 1927, \$789,637.46.

^{d/} Nevada.

As to distribution of proceeds. In case of rentals and royalties for lands in the public domain, 52½% of the receipts go to Federal Government's Reclamation Fund, 37½% to the State in which the land is located, and 10% to the General Fund of the Treasury. In case of rentals and royalties for minerals located in acquired lands, 25% of the income usually goes to the funds of the country in which the deposits are located and the remaining 75% to the Federal Treasury.

Cooperation with Other Federal Agencies. The Bureau of Land Management maintains cooperative arrangements with the Department of Interior's Bureau of Reclamation, and Fish and Wildlife Service, and also with the Department of Agriculture's Forest Service, Soil Conservation Service, and Farm Security Administration. These arrangements aim at preventing issuance of oil and gas leases or to limit the activities of lessees wherever operations under leases interfere with activities under the jurisdiction of the above five agencies. Cooperative arrangements are also maintained with the Navy Department and the Bureau of Mines with a view of preventing drainage of Naval Petroleum Reserves and helium reserves, respectively. The Bureau cooperates with the Geological Survey which supervises all technical operations under oil and gas leases issued by the Bureau of Land Management, and reviews applications for unitization agreements.

REPORT ON ACTIVITIES OF THE OFFICE OF INDIAN AFFAIRS WITH
REGARD TO PETROLEUM, NATURAL GAS AND RELATED HYDROCARBONS

Introduction

Creation. The Office of Indian Affairs was created in the War Department in 1824 and transferred to the Department of the Interior at the time of its establishment in 1849.

Purpose. The purpose of the Office is to carry out the provisions of nearly 5,000 statutes and treaties in order to protect the interests and promote the welfare of more than 417,000 Indians, including more than 30,000 natives (Indians, Aleuts and Eskimos) of Alaska.

Organizational Outline. The Office is composed of a headquarters staff in Chicago, Ill., a liaison office in Washington, D.C., five district offices, the Alaska Native Service which has the same organizational status as a district office, and several score field jurisdictions which are the operating units in the field. The field jurisdictions include Indian agencies, schools, sanatoria and irrigation projects. The headquarters organization is called the Office of the Commissioner, and is made up of the Commissioner of Indian Affairs, who is the chief executive of the Bureau, two Assistant Commissioners, two staff offices (Office of Chief Counsel and Office of Information), and five technical Branches: Administration, Education, Engineering, Health, and Resources.

Each District Office consists of a District Director, a District Counsel, and a small staff of District supervisors who direct the execution of approved plans and programs for field jurisdictions within the District in accordance with the policies, objectives and standards established by the Office of the Commissioner, and provide technical and professional assistance to the field jurisdictions. The District Offices conduct programs which are beyond the capacity or responsibility of the field jurisdictions.

Each field jurisdiction is under the immediate direction of a Superintendent, but the organization of a jurisdiction varies considerably depending upon the particular unit and the scope of activities involved. There are four types of field jurisdictions: (1) Agencies which conduct all activities of the Office of Indian Affairs on a particular reservation, in contrast to the other three types of field jurisdictions whose activities are specialized. (2) Detached boarding schools. (3) Detached hospitals and sanatoria. (4) Detached irrigation projects.

The general functions of the Office of Indian Affairs with regard to oil and natural gas activities are twofold: (1) the administration of the oil and gas leasing system within the framework set up in several acts of Congress (Tribal Lands, Act of May 11, 1938, 52 Stat. 347; Allotted Lands, Act of March 3, 1909, 35 Stat. 781), and (2) administration of the

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expenditure and investment of profits derived from the Indians' royalty share. In the exercise of these functions the office acts in a special fiduciary relationship to the Indians who are the lesser-owners of the mineral deposits on their lands.

The foregoing general functions with regard to oil and natural gas are performed by (a) the central office, and (b) field agencies of the Office.

Central Office

Organization. The major organizational unit within the Office of Indian Affairs dealing with the petroleum resources of the Indians is the Resources Branch. The Branch develops plans for the conservation and improvement of 56,000,000 acres of Indian lands, water, minerals, forests, wildlife and other resources. It provides agricultural and industrial guidance, handles oil, gas and mineral leases and mining permits, rights-of-way and boundary disputes and provides credit facilities to assist Indians in establishing themselves in income-producing enterprises related to the utilization of resources. The Branch of Reserves is composed of three Divisions: Forestry, Irrigation, and Land. The Land Division consists of three Sections: Acquisition and Tenure Adjustments, Claims and Rights-of-Way, and Minerals and Oil. The activities of the Resources Branch relative to petroleum and natural gas are centered within the Minerals and Oil Section of the Land Division.

Functions. The main and specific oil and natural gas functions of the Minerals and Oil Section are:

1. Offering of Indian lands for lease at public sale: The method of handling this function varies with the type of land involved. Allotted lands are selected and offered for lease at public sale without obtaining specific authority from the Secretary of the Interior. As to tribal lands, the authority to offer these lands must come from the tribal council and the Secretary of the Interior.
2. Approval or other administrative action on the leases: With regard to allotted lands these functions are performed by the Commissioner of Indian Affairs; as to tribal lands by the Secretary of the Interior.
3. Approval or other administrative action on assignments of allotted and tribal lands.
4. Action on surety bonds supporting leases, allotted and tribal.
5. Acceptance of voluntary surrender of leases, tribal or allotted.
6. Approval or other administrative action on all contested leases.

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7. Approval or other administrative action on unit agreements.
8. Issuance of permits for geological or geophysical prospecting.
9. Renewal of ceded land leases issued under special acts.
10. Approval or other administrative action on sales of oil, estate or royalty interests.

Personnel. The personnel of the Minerals and Oil Section, the time devoted to oil and gas activities and the salaries of the employees are as follows:

	Time Devoted to Oil and Gas Work	Base Salary
Legal-Advisor, Chief of Section, P-4	80%	\$4902.00
Administrative Assistant, CAF-7	50%	3397.20
Clerk, CAF-6	95%	3021.00
Stenographer-Clerk, CAF-4	80%	2394.00

The Minerals and Oil Section handles mining leases on all kinds of minerals on Indian lands: coal, copper, gold, vanadium, asbestos, etc. Hence, not all of its time is devoted to oil and natural gas activities.

Field Agencies

Functions. In the field, the oil and gas activities of the Office of Indian Affairs are carried out by Agencies. Their main functions -- besides conducting other activities of the Office -- are advertising and holding the lease sales, advising and assisting the Indians in the execution of leases, fulfilling the requests of oil company representatives and lease brokers for title information and for information as to departmental requirements in the purchase and making of leases, and supervision of the income derived from the sale of leases and from the lease rentals and production royalties.

It should be mentioned that in one instance - the Osage Agency - the functions of the field office deal also with the supervision of the development and producing operations. Under the Superintendent of the Osage Agency is the Oil and Gas Supervisor, whose functions are enumerated in detail in the Osage regulations. (Code of Federal Regulations, Part 180, Title 25).

Groups, location, personnel and expenditures. There are roughly three groups of Agencies to be discerned from the point of extensiveness of their oil and gas activities.

To agencies performing extensive oil and gas activities belong: in Oklahoma: Osage, Five Tribes, Kiowa, Pawnee, Cheyenne and Arapahoe, and Shawnee; in Wyoming: Wind River; in Montana: Blackfeet.

The Osage and Five Tribes Agencies have organizations dealing specifically with oil and gas.

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The Oil and Gas Division of the Osage Agency requires the services of fifteen persons at a yearly expenditure (salaries plus travel expenses) of \$54,048.77. The organization dealing with oil and gas activities within the Five Tribes Agency requires the services of six full time employees at an annual aggregate salary amounting to \$20,374.08 and six part time employees at an annual aggregate salary of \$6,196.92. The estimated average of time spent on oil and gas work by the personnel of each of the remaining agencies of the first group is: 75% by a land clerk, 50% by an additional clerk, possibly 5% by the Superintendent; the approximate expenditure for the oil and gas activities at each of these Agencies is \$4,000 per year.

To Agencies performing some oil and gas activities belong: In Arizona and New Mexico: Navajo; in California: Consolidated; in Utah: Uintah and Ouray; in Montana: Crow.

The estimated average of time spent on oil and gas work by the personnel of each of the above agencies is: 25% by a land clerk and a small proportion of the Superintendent's time; the approximate expenditure for the oil and gas activities at each of the Agencies is \$1,000 per year.

To Agencies performing occasional oil and gas activities belong: in Mississippi: Choctaw; in New York: New York; in Washington: Taholah; in South Dakota: Pine Ridge; in Wisconsin: Tomah; in New Mexico: United Pueblos and Jicarilla; in Kansas: Potawatomi; in Arizona: Hopi and Pima; in Montana: Rocky Boy's and Tongue River.

At each of the above Agencies the superintendent and the land clerk spend a small percentage of their time on oil and gas activities; the expenditures sustained for this work amount to less than \$500 per year per Agency.

Cooperative Arrangements

Relationship with the Geological Survey. After a lease is sold and executed by the Indian allottee or his heirs, or by the tribal council in the case of tribal lands, and becomes effective through approval by the Secretary of the Interior, the supervisory role of the Office of Indian Affairs becomes subordinate to that of the Geological Survey. The lease becomes subject to the oil and gas operating regulations of the Survey, and the lessee's relationships thenceforth are largely with the engineers of that Service.

The Survey maintains two services for Indians under a cooperative arrangement with the Office of Indian Affairs, pursuant to the Secretary's Order No. 1112, (1) an accounting supervision to insure correct determination and settlement of royalty liability, and (2) an engineering supervision to assure that operations are conducted in such manner as to protect the deposits of the leased lands and result in the maximum ultimate recovery of oil and gas with minimum waste. The supervisory jurisdiction of the Survey applies to all Indian land leases except those on the Osage Reservation, where all operations are under the supervision of the Oil and Gas supervisor of the Osage Agency, who is paid from tribal funds.

Relationship with the Bureau of Land Management. The Bureau leases oil and gas lands in the Red River, Oklahoma, in which the Indians of the Kiowa Reservation have a royalty interest under decree of the Federal Court and Act of Congress.

A REPORT ON THE OIL AND NATURAL GAS ACTIVITIES OF
THE OIL AND GAS DIVISION OF THE DEPARTMENT OF THE INTERIOR

Creation. In a letter of May 3, 1946, the President of the United States requested the Secretary of Interior "to undertake the initiative in obtaining coordination and unification of Federal policy and administration with respect to the functions and activities relating to petroleum carried on by the various Departments and Agencies." He enunciated as a principle that "where practical and appropriate Governmental activities relating to petroleum should be centralized," and he directed that from time to time the Secretary of Interior submit to him for consideration proposals looking to the accomplishment of this objective." Pursuant to the instructions of the President, the Secretary of Interior by Order No. 2193 of May 6, 1946, established the Oil and Gas Division.

PURPOSE. The purpose of the Oil and Gas Division is as follows:

1. To assist the Secretary in the execution of the President's instructions to: (a) coordinate and unify policy and administration in respect to the functions and activities relative to oil and gas carried on by the several Departments and Agencies of the Federal Government; (b) serve as the channel of communication between the Federal Government and the petroleum industry; (c) serve as liaison agency of the Federal Government in its relations with the appropriate State oil and gas bodies; and (d) review technological developments in the field of petroleum and synthetic hydrocarbon fuels and coordinate Federal policy with respect thereto.
2. To obtain and analyze information as to oil and gas matters in which the Federal Government has a proper interest and, in this connection, serve as the central Federal clearing house for statistics, technical data and other information relating to oil and gas.
3. To keep the Secretary informed with respect to the adequacy and availability of supplies of petroleum and its products to meet the current and future needs of the nation, and with respect to significant developments in the petroleum field, and make recommendations with respect thereto.
4. To coordinate all oil and gas policies and activities in the Department of the Interior.

Organization and Functions. The Oil and Gas Division consists of the Office of the Director and five branches: Administrative Section, Legal Section, Conservation and Reserves, Supply and Economics, and Technical and Research. The specific functions of the Office of the Director and the foregoing branches are as follows:

The Office of the Director heads the Oil and Gas Division and consists of a Director, who is assisted by an Associate Director, two Assistant Directors, a personal assistant, and four clerk-stenographers. The Assistant Directors are charged individually and collectively with the bulk of the oil and gas division policies, procedures and administrative responsibilities. The Directors serve as liaison officers between the Secretary of the Interior and the National Petroleum Council, and advise the Secretary on all matters pertaining to petroleum, its products and synthetic fuels. They are also responsible for developing a sound, clear-cut plan of organization through which the oil and gas activities of the Federal Government can be most effectively and economically directed, coordinated and controlled, in pursuance of the President's direction.

The Administrative Section is charged with coordination of internal activities and business operations, and includes personnel, budgeting, accounting, payrolls, and other general administrative functions.

The Legal Section facilitates the operations of the Oil and Gas Division by providing legal advice throughout the agency and assisting the Director in the verification that all actions are consistent with the authority delegated to it. The Section prepares all orders and regulations issued or initiated by the Division, reviews and approves, from a legal point of view, all outgoing documents, and handles for the Division all litigation in which the Division may have an interest or to which the Division may be a party.

The Conservation and Reserves Section's principal function is the administration and enforcement of the Connally Hot Oil Act. This law is administered under the direction of the Secretary of the Interior as the agent of the President. The greater part of these functions of the Section are in the field. In addition, the section assembles and maintains all available information concerning foreign and domestic crude oil and natural gas reserves, including the adequacy of such reserves to meet current and foreseeable future requirements. The Section studies and reports from time to time on the improvement of conservation practices and the prevention of waste and the exploration for and development of oil and gas reserves; the optimum utilization of such resources; and studies and investigates methods whereby the Federal Government can take appropriate action to encourage the exploration for needed new reserves and promote secondary recovery projects to assure maximum recovery from known reserves.

The Supply and Economics Section (1) formulates integrated short and long range program alternatives for meeting world-wide oil requirements of the United States to the best advantage within available production, processing, and transportation resources as a basis for the determination of short and long range national economic and national security petroleum objectives, such alternatives to be based on varying conditions and circumstances as indicated by the State Department and the Departments of War and Navy; (2) maintains currently an inventory of the national petroleum potential, and in this activity, furnishes to the military full information with respect to petroleum supply and requirements for military and other

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essential uses under such varying conditions and during such periods as may be indicated; (3) obtains, analyzes, and completes current or pertinent and available facts, figures, and other data with respect to the economic status of the petroleum industry, including the economic relationship of oil and gas to other energy resources and formulates recommendations based thereon; (4) compiles, analyzes, interprets and disseminates all available information as to oil and gas matters in which the Federal Government has the proper interest, and serves as the central Federal clearing house for statistics, technical data, and other information relating to oil and gas; (5) establishes and maintains appropriate relationships with oil and gas companies and trade associations, and with other Federal and State Governmental agencies, in the assembly and distribution of statistical data and reports.

The Technical and Research Section is charged with reviewing worldwide technological developments and research in the fields of production, processing, transportation and utilization of petroleum and synthetic hydrocarbon fuels and assists in the coordination of Federal policy and activities with respect to such developments. The Section provides technical advice, assistance and information to other sections of the Division, other agencies of the Government, especially the military and the oil industry on all such matters.

Personnel and Expenditures. The Oil and Gas Division requires the services of approximately 95 persons. The expenditures for the fiscal year 1947 are \$444,900.

REPORT ON ACTIVITIES OF OTHER AGENCIES WITHIN THE DEPARTMENT
OF THE INTERIOR WITH REGARD TO OIL, NATURAL GAS, AND RELATED
HYDROCARBONS

Bureau of Reclamation

The Bureau was established in 1902 to administer the Federal Reclamation Laws in 17 western states. Through the utilization of land and water resources, the Bureau promotes the development of agricultural and industrial economics. The Bureau constructs and operates multiple purpose projects providing water for irrigation, hydroelectric energy, control of floods, aids to navigation, water for domestic and industrial uses, and other purposes. The Bureau is composed of a headquarters staff located in Washington, D.C., and in Denver, Colorado, seven regional offices and a number of project and other field offices.

The Bureau's primary interest in petroleum activities is in safeguarding against the contamination of the water supply of proposed and constructed Federal reclamation projects and in protecting the interests of the settlers thereon.

The procedure followed in passing on applications filed with the Bureau of Land Management for oil and gas leases under the provisions of the Act of February 25, 1920, as amended, insofar as such applications affect land withdrawn for reclamation purposes, is as follows:

A copy of the serial register page relating to the individual application is forwarded by the Manager of the District Land Office to the Project Superintendent who checks the description of the lands applied for against a map of the project in order to determine whether any of the project features will be affected by the proposed oil drilling operations. The Project Superintendent's report is forwarded to the Bureau for Reclamation, through the appropriate Regional Director, for review and report to the Bureau of Land Management. In cases where lands have been withdrawn for a proposed reclamation project, the serial register page is forwarded directly to the Regional Director for a report which in turn is transmitted to the Bureau of Reclamation for review.

Various types of stipulations have been adopted for incorporation in oil and gas leases where it appears that oil drilling operations may conflict with the interests of the reclamation project. The stipulations are recommended to the Bureau of Land Management for incorporation in the standard form of lease (4-208 f) issued by that office, and are identified as Sections 3(g), 10, 11 and 12. The Section 3(g) is used for the protection of features on proposed projects while the other three are applied to leases affecting lands on constructed projects.

The work required in handling oil and gas reports on the part of the Bureau is incidental. Accordingly, no specific personnel have been detailed to handle such work and no estimate as to funds expended is available.

Fifty-two and one-half percent (52½%) of all rentals and royalties received under the Mineral Leasing Act of 1920, is deposited in the General Reclamation Fund of the Treasury Department.

Departmental Order No. 2223 of July 11, 1946, granted the Bureau of Land Management jurisdiction, with regard to oil and gas leasing activities, on lands acquired for reclamation and other purposes by the Department. The regulations under this order have not been promulgated to date, but it is expected that, with respect to lands acquired for reclamation purposes, the reports will be handled in a manner similar to that outlined for public lands. All lands and/or royalties collected from such operations will be deposited in the General Reclamation Fund of the Treasury and credited to the project for which the lands were acquired.

No contacts are maintained with the oil industry other than infrequent requests for information as to whether certain reclamation lands might be available for leasing purposes.

The Bureau of Reclamation handles requests for pipe line rights-of-way over acquired lands only. Authority for granting of rights-of-way is retained in the Washington Office. In the case of intermingling public and acquired lands, the request is usually referred to the Bureau of Land Management, along with any appropriate recommendations of the Bureau of Reclamation.

The National Park Service

The Service promotes and regulates the use of national parks, monuments, and similar reservations in conformity with the statutory mandate "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The Service performs no functions relating directly to the petroleum and gas industry.

There are, however, a few areas administered by the Service pending their ultimate disposition, such as Public Works project lands adjacent to national parks, where oil and gas problems can arise. For instance, in connection with the application for an oil and gas permit covering lands in the Olympic Public Works Project, Washington, it was necessary to conduct rather extensive investigations to evaluate the detrimental effect of the granting of the permit upon the use of the land for the purposes for which it was acquired as balanced against the war needs. Termination of the hostilities removed any justification for issuance of the permit on the basis of war necessity and the application was denied by the Secretary. This was an isolated case and the work was handled by regular employees of the Service as an incident to their regular duties.

The Park Service is called upon from time to time to make studies of areas suggested for national park or monument status to determine their suitability for such status and the feasibility of their establishment from the standpoint of land costs and related factors. The possible presence of oil and gas values, of course, has to be considered in these studies as well as the effect of oil development upon the administration, protection, and development of the areas proposed for national park or monument status. There have also been a few occasions where consideration had to be given to the acquisition of State or private lands in authorized areas subject to a reservation of oil and gas rights. As an illustration, the State of Mississippi has recently indicated its desire to retain oil, gas, and mineral rights in certain lands which it has acquired for donation to the United States for the Natches Trace Parkway Project.

Since public lands temporarily withdrawn from settlement in contemplation of their possible addition to the National Park System are subject to the Mineral Leasing Act, oil and gas questions requiring consideration by this Service arise when applications for oil and gas leases are filed with the Bureau of Land Management. The function of this Service in these cases is to furnish the Bureau with appropriate recommendations concerning the issuance of the leases and possible restrictive clauses to be included therein, based upon a study of the probable effect of oil operations upon the proposed public use of the lands. In some instances these studies involve considerable investigative work in the field. Such work is performed by regular employees of the Service along with their regular duties.

As to oil and gas pipe lines across lands under the jurisdiction of the Service, the agency has a policy of meeting with company engineers to assist in laying out routes skirting the boundaries of the foregoing lands. The only exception is the National Capital Parks area in Washington, D.C., where the American Oil Company was permitted to lay a pipe line from the vicinity of Key Bridge to Rosslyn, and the Sinclair Oil Company built a pipe line in the northwest section of the City.

The Fish and Wildlife Service

The Service is charged with carrying out the provisions of laws designed to increase the stocks of fish and wildlife, resist depletion, disseminate knowledge and extend the use of these living resources, and with the enforcement of protective laws relating to fish and game and the commercial fisheries of Alaska. The Service has no specific oil and gas functions.

Since oil developments are detrimental to wildlife, the Service follows the general practice of objecting to oil and gas exploration and drilling on refuge lands which are administered by the Service. There are, however, exceptions. A unitization agreement including portions of a game refuge in New Mexico is under consideration at present and may be approved.

In some instances the Service acquires lands for wildlife refuge purposes in areas where oil drilling may be in progress. If the Service feels that wildlife restoration might be adversely affected by development of mineral rights, the deed conveying the lands to the Government contains recapture clauses providing for the recovery by the Government of the purchase price of

the lease through the grantor's assignment of an equitable percentage of the royalties. Normally, the Service provides for the recapture of 40% of the grantor's 1/8th royalty.